The authors describe techniques and machinery used in silting mines to prevent subsidence, and offer suggestions for the further mechanization of this process. The text contains 8 figures. There are no references.

It has been observed that the angle of natural repose of ore, an important factor which affects various mining designs, decreases with an increase in the size of broken ore. The authors discuss recent analytical and numerical data on the subject. There are 5 figures, 4 tables, and 2 Soviet references.

Subsurface crushing offers the following advantages: 1) better working conditions and increased safety, 2) increased productivity, 3) more proficient mucking and tramming, and 4) more efficient utilization of hauling and hoisting equipment. Various designs are submitted by the authors. There are 4 figures, 12 tables, and 36 references, of which 24 are Soviet, 9 English, 2 German and 1 French.

Bronnikov, D.M., Candidate of Technical Sciences, and Chistov, V.A., Mining Engineer. The Effect of Blasting-hole Deviation on Ore Production 140

The authors propose and describe methods and techniques for increasing ore output through the control of boreholes by means of electric pulse and gyroscopic equipment. There are 14 figures and 5 tables. There are references.

Baron, L.I., Doctor of Technical Sciences, and Voronyuk, A.S., Can-

age and block-carving, a worked out block filled with granulated ore and small wooden cubes (1 cc. in size) was used as a model. The passage of such wooden models provides an idea of the pattern of ore passage. There are 8 figures, 2 tables, and 2 Soviet references.

PART III. SUBSURFACE EXPLOITATION OF COAL DEPOSITS

Novikov, K.P., Candidate of Technical Sciences. Rational Values for Elements in Longwall Methods of Coal Extractions 177

The technical and economic problems in coal production depend on a number of factors such as thickness and dip of seam, timbering, etc. For example, the length of the working face depends on the thickness of the seam. The author gives an analytical estimate of all factors influencing coal mining. There are 9 figures. There are no references.

Baranovskiy, V.I., Candidate of Technical Sciences. Development

PART IV. OPEN-CUT MINING

AVAILABLE: Library of Congress

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12-18-58

KOVAZHENKOV, Aleksandr Vasil'yevich; BARSUKOV, Fedor Aleksandrovich; AGOSHKOV, M.I., otvetstvennyy red.; NIKOLAYEVA, I.N., red. izd-va; POLKNOVA, T.P., tekhn. red.

[Studying parameters of underground breaking of ore in deep mines] Issledovanie parametrov podzemnoi otboiki rudy glubokimi skvazhinami. Moskva, Izd-vo Akad. nuk SSSR, 1958. 129 p. (MIRA 11:8)

1. Chlen-korrespondent Akademii nauk SSSR (for Agoshkov).
(Mining engineering)

Dissertations. Dept. of Technical Sciences, Jul-Dec 1957.
Vest. Ak Nauk SSSR, 1958, No. 4, pp.123-123 (USSR)

At the Mining Institute the following dissertations were defended:
for the degree of Doctor of Technical Sciences:

A. Ch. MUBIN - Investigation of the System With Open Purification Space With Adaption to the Exploitation of Sloped Deposits of Dzhezkazgan.

M. A. AL'TSHULER - Improvement of the Exploitation System by Means of Mine Production.

F. A. BARSUKOV - Investigation of the Important Parameters of the Subterranian Extraction by Means of Deep Gaps in the Exploitation of Thick Deposits of Solid Ores With a Magnetic Anomaly of Kursk.

V. I. GOLOMOLZIN - Determination of the Optimum Parameters of the Pits Under the Condition of the Krasnoarmeysk District of the Donets Basin.

G. P. NIKONOV - Investigation of the Hollowing Out of Uncovered Rocks in a Hydraulic Excavator Exploitation of Coal Deposits.

A. D. POMORTSEV - Investigation of the Suitability of the Exploitation of Steep Layers of a Thickness of 2-4, by Means of a Shield System.

BARSUKOV, F.A.

Effect of blasting operations on the stability of room pillars.
Biul. TSIIN tsvet. met. no. 6:5-8 '58. (MIRA 11:7)
(Mining engineering)

AGOSHKOV, M.I.; BRONNIKOV, D.M.; KOVAZHENKOV, A.V. [deceased]; NIKANOROV, V.I.; MOCHALIN, M.P.; VORONYUK, A.S.. Prinimali uchastiye: KRASAVIN, G.A.; GAGULIN, M.V.; BARSUKOV, F.A.. TERPOGOSOV, Z.A., kand. tekhn.nauk, otv.red.; NIKOLAYEVA, I.N., red.izd-va; DOROKHINA, I.N., tekhn.red.

[Investigating the main technological processes of underground mining of thick hard ore deposits] Issledovanie osnovnykh tekhnologicheskikh protsessov pri podzemnoi razrabotke moshchnykh mestorozhdenii krepkikh rud. Moskva, Izd-vo Akad.nauk SSSR, 1959. 359 p. (MIRA 13:2)

1. Chlen-korrespondent AN SSSR (for Agoshkov).
(Mining engineering) (Ore dressing)

DUBNOV, L.V., doktor tekhn.nauk; BARSUKOV, F.A., kand.tekhn.nauk

"Shattering properties of explosives for mining" by L.I.Baron, B.D.Rossi, S.P.Levchik. Gor. zhur. no.9:79 S '61. (MIRA 16:7)

1. Vsesoyuznyy zaochnyy politekhnicheskiy institut, Moskva.
(Explosives) (Mining engineering) (Baron, L.I.) (Rossi, B.D.) (Levchik, S.P.)

BARSUKOV, F.A., inzh.; IVANOV, V.S., inzh.

Safety of underground blasting operations. Bezop.truda v prom. 3 no.12:11-13 D '59. (MIRA 13:4)
(Blasting--Safety measures)

RACHKOVSKIY, S.Ya.; BARSUKOV, F.A.

Analysis of the efficiency of capital investments in enterprises of the Krivoy Rog Basin and the Kursk Magnetic Anomaly. Gor. zhur. no.8:9-12 Ag '62. (MIRA 15:8)
(Krivoy Rog Basin--Iron mines and mining)
(Kursk Magnetic Anomaly--Iron mines and mining)

BARSUKOV, F.A., kand.tekhn.nauk

Effect of the quality of ore shattering in breaking on the productivity of labor. Vzryv. delo no.50/7:153-156 '62.
(MIRA 15:9)

1. Vsesoyuznyy zaochnyy politekhnicheskiy institut.
(Blasting)
(Mining engineering--Labor productivity)

BARSUKOV, Fedor Aleksandrovich; RACHKOVSKIY, Solomon Yakovlevich; NAGIBIN, Pavel Vasil'yevich, kand.ekon.nauk, retsenzent; VEREMEY, Yelena Nikolayevna, retsenzent; REYGIN, Lazar' Moiseyevich, otv. red.

[Economic efficiency of capital investments in iron mining] Ekonomicheskaia effektivnost' kapital'nykh vlozhenii v zhelezorudnuiu promyshlennost'. Moskva, Izd-vo "Nedra," 1964. 110 p. (MIRA 17:5)

AKSENOV, N.N.; BARSOV, I.P.; BARSUKOV, F.D.; BEZRUCHENKO, I.F.; BUROV, D.T.; BURLYAY, A.A.; VASIL'YEV, G.I.; VOSTOKOV, Ye.I.; GOLOV, M.A.; IL'IN, M.M.; KAMSYUK, S.A.; KOLESOV, A.N.; KOPOTEV, A.N.; LEVITAN, S.D.; LYSOV, G.B.; LYAL'CHUK, V.K.; L'VOV, N.A.; LYAPUNOVA, A.I.; MISHKOV, K.V.; NASTYUKOV, G.A.; NIGOF, V.N.; PESKOV, K.A.; PERFIL'YEV, A.P.; SARUKHANYAN, R.L.; SIDORKOV, I.A.; SMIRNOV, A.N.; SURIN, P.I.; SYSOYEV, V.D.; TISHCHENKO, A.A.; FILIPPOV, G.P.; FOMICHEV, A.M.; YAKOVLEV, I.P.; MURAV'YEV, A.I., polkovnik, red.; ZUDINA, M.P., tekhn.red.

[Service clubs; a practical reference book] Klub voinskoi chasti (korablia); spravochno-metodicheskoe posobie. Moskva, Voen.izd-vo M-va obor.SSSR, 1961. 342 p. (MIRA 14:4)

1. Russia (1923- U.S.S.R.) Glavnoye politicheskoye upravleniye Sovetskoy Armii i Voyenno-Morskogo Flota. Upravleniye propagandy i agitatsii.
(Soldiers--Recreation)

BARSUKOV, F.I

"An Instrument for Measuring the Parameters of Oscillatory Circuits," Radio, No.1, pp. 46-48, 1953

The test instrument designed as an attachment to the GSS stud signal generator consists of an rf amplifier, detector, resonance indicator, and a power pack, and measures inductances from 1 mh to 10 mh and capacitances from 1 to 600 pico-farads. It is used to measure the resonance frequency of tuned circuits, their inductance and capacitance, the inductance and inter turn capacitance of separate coils, witing capacitance, inter-electrode capacitance of tubes, etc.

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BARSUKOV, Filipp Ivanovich; BERG, A.I., redaktor; DZHIGIT, I.S., redaktor; KULIKOVSKIY, A.A., redaktor; SMIRNOV, A.D., redaktor; TARASOV, F.I., redaktor; TRAMM, B.F., redaktor; CHECHIK, P.O., redaktor; SHAMSHUR, V.I., redaktor; TARASOV, F.I., redaktor; LARIONOV, G.Ye., tekhnicheskiy redaktor.

[Three-tube radio receiver] Trekhlampovyi radiopriemnik. Moskva, Gos. energ. izd-vo, 1956. 15 p. (Massovaia radiobiblioteka no.238) (Radio--Receivers and reception) (MLRA 9:6)

NELEPETS, Vladimir Vasil'yevich, inzh.; NELEPETS, Vasiliy Stanislavovich, inzh., dotsent, kand.tekhn.nauk; BARSUKOV, F.I., red.; SOKOLOVA, G.F., tekhn.red.

[Pulse techniques in radio circuits] Impul'snye rezhimy v radiotekhnicheskikh tsepiakh. Moskva, Voen.izd-vo M-va obor. SSSR, 1960. 181 p. (MIRA 13:10)
(Pulse techniques (Electronics)) (Radio circuits)

BARSUKOV, F.I., inzh.-mayor, kand.tekhn.nauk; BELYAYEV, Yu.I., inzh.-mayor

Books on television ("Electric transmission of pictures" by A.V.Tarantsov. Reviewed by F.I.Barsukov, IU.I.Beliaev). Vest.Vozd.Fl. no.6:87-89 Je '60. (MIRA 13:7)
(Television) (Tarantsov, A.V.)

BARSUKOV, Filipp Ivanovich; MAKSIMOV, M.V., red.; SHIMOKOVA, M.M., tekhn. red.

[Radio telemechanics]Radiotelemekhanika. Moskva, Gosenergoizdat, 1962. 87 p. (Massovaia radiobiblioteka no.433) (Radio control) (Electronic control) (MIRA 15:10)

MAKSUKOV, Filipp Ivanovich; MAKSIMOV, Matvey Vasil'yevich; STERLIGOV, V.L., red.; CHAPAYEVA, R.I., tekhn. red.

[Radio-telemetry] Radiotelemetriia. Moskva, Voenizdat, 1962. 183 p. (MIRA 15:8)
(Telemetering)

BARSUKOV, F.I.; SHAROGORODSKIY, S.G., red.; KOLACHEV, S.G., tekhn. red.

[Radiotelemetry] Izmereniia na rasstoianii. Moskva, Voenizdat, 1963. 68 p. (MIRA 16:5)
(Telemetering)

BARSUKOV, F.I.; SHAROGORODSKIY, S.G., red.; KOLACHEV, S.G., tekhn. red.

[Telemetering] Izmereniia na rasstoianii. Moskva, Voenizdat, 1963. 68 p. (MIRA 17:2)

[illegible] V, A.P. - req.; [illegible], [illegible] red.

[Electronic [illegible] for measuring [illegible] quantities; [illegible] distribution of radio materials [illegible]] Elektronnye pribory dlia izmereniia [illegible] velichin, raspredeliaemykh v [illegible]. Moskva, Izd-vo "Energiia," 1964. 56 p. (Biblioteka radiolyubitelya, no.[illegible]) (MIRA [illegible])

BARSUKOV, Filipp Ivanovich; SHUMIKHIN, Yu.A., red.

[Low-frequency generators and selective amplifiers] Generatory i selektivnye usiliteli nizkoi chastoty. Moskva, Energiia, 1964. 79 p. (Massovaia radiobibliotekа, 536) (MIRA 17:9)

IZYUMOV, Nikolay Mikhaylovich; LINDE, Dmitriy Pavlovich;
BARSUKOV, F.I., red.

[Fundamentals of radio engineering] Osnovy radiotekhniki
Izd.2., perer. Moskva, Energiia, 1965. 478 p. (Massovaia
radiobiblioteka. Uchebnaia seriia, no.578) (MIRA 18:7)

L 47068-65 EEO-2/EWT(1)/EEC-4/EED-2/EWA(h) Pn-4/Peb/Pl-4 JM

ACCESSION NR: AP5010380 UR/0108/65/020/004/0036/0044 25 B

AUTHOR: Barsukov, F. I. (Active member)

TITLE: Statistical characteristics of chaotic pulse noise at the output of a pulse-group selector

SOURCE: Radiotekhnika, v. 20, no. 4, 1965, 36-44

TOPIC TAGS: selector, pulse group selector, pulse noise, statistical characteristic, multichannel radio line

ABSTRACT: The problem pertains to multichannel pulse-phase-modulation radio lines where the receiver decoder includes pulse-group selectors for a pulse-code division of channels. Formulas for the law of distribution of the pulse-duration probability (7), the average pulse duration (8), the pulse-noise autocorrelation (15) and crosscorrelation (19) functions at the outputs of working and reference channels of the communication system are developed. A typical semiconductor-

Card 1/2

L 47068-65
ACCESSION NR: AP5010380

diode circuit of the pulse-group selector is considered. The crosscorrelation function is determined for two coincidence stages with parallel-connected inputs. Orig. art. has: 7 figures and 32 formulas.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi (Scientific and Technical Society of Radio Engineering and Electrocommunication)

SUBMITTED: 09Apr62 ENCL: 00 SUB CODE: EC

NO REF SOV: 004 OTHER: 000

Card 2/2

BARSUKOV, G.F., glavnyy veterinarnyy vrach Sychevskogo rayona, Smolenskoy oblasti.

Control of trichomoniasis. Veterinariia 33 no.6:22-23 Je '56. (MLRA 9:8)

(Sychevka District--Trichomoniasis)

KOZNOV, N.A., kandidat veterinarnykh nauk; BARSUKOV, G.F.

Listerellosis in swine. Veterinariia 34 no.5:23-24 My '57.
(MLRA 10:6)

1. Nachal'nik veterinarnogo otdela Smolenskogo oblsel'khozupravleniya (for Koznov). 2. Glavnyy veterinarnyy vrach Sychevskogo rayona (for Barsukov).

(Swine--Diseases and pests) (Listerellosis)

BARSUKOV, G.G., inzhener-mekhanik; PERTYAKOV, R.S., gornyy inzh.

Using the D-384 bulldozer in the Olenegorsk open-pit mine. Gor. zhur. no.3:47-48 Mr '63. (MIRA 16:4)

1. Olenegorskiy gornoobogatitel'nyy kombinat.

BARSUKOV, G. M. Cand Agr Sci -- (diss) "Cultivation of corn in Kurskaya Oblast."
Kursk, 1959. 19 pp (Min of Agr RSFSR. Stalingrad Agr Inst), 200 copies

(KL, 43-59, 126)

BARSUKOV, G. P., Cand Med Sci -- (diss) "Penetrating chest wounds during peacetime." Khabarovsk, 1958. 22 pp; (Khabarovsk State Medical Inst); 200 copies; price not given; (KL, 17-60, 167)

BARSUKOV, G.P.

Surgery of wounds of the heart. Khirurgiia 35 no.10:46-51 O '59.
(MIRA 12:12)

1. Iz kliniki gospital'noy khirurgii (zav. - prof. M.A. Khelimskiy) Khabarovskogo meditsinskogo instituta.
(HEART wds. & inj.)

BARSUKOV, G.P.

Late result of auto-osteoplasty in osteomyelitis of the ulna.
Ortrop.travm.i protez. 21 no.3:56-57 Mr '60. (MIRA 14:3)

1. Iz kliniki gospital'noy khirurgii (zav. - prof.M.A.Khelimskiy) Khabarovskogo meditsinskogo instituta (dir. - dotsent S.K.Nechepayev).
(ULNA—SURGERY) (OSTEOMYELITIS)
(BONE GRAFTING)

BARSUKOV, G.P., kand.med.nauk

Late results of successful reimplantation of a hand hanging on a small piece of skin. Khirurgiia no.8:109-110 Ag '61. (MIRA 15:5)

1. Iz gospital'noy khirurgicheskoy kliniki (zav. - prof. M.A. Khelimskiy) Khabarovskogo meditsinskogo instituta.
(HAND--WOUNDS AND INJURIES)

BARSUKOV, I.A., inzhener; LAVRINOVICH, L.L., inzhener.

Exhibition of instruments made in the Hungarian People's Republic. Vest.elektroprom. 27 no.1:69-71 Ja '56. (MIRA 9:6)

1.Nauchno-issledovatel'skiy institut Ministerstva elektropromyshlennosti.
(Moscow--Electric instruments--Exhibitions)

AUTHOR: Barsukov, I.A., Engineer and Lavrinovich, L.L., Engineer.

TITLE: Modern methods of inspecting dimensions in engineering (from materials of an exhibition in East Germany). (Sovremennye metody kontrolya razmerov v mashinostroyenii.)

PERIODICAL: "Vestnik Elektropromyshlennosti" (Journal of the Electrical Industry) 1957, Vol. 28, No. 4, pp. 63 - 65 (U.S.S.R.)

ABSTRACT: In December, 1956, an exhibition was held of instruments made by two firms of East Germany, "Feinmesszeugfabrik" and "Massindustrie". The equipment exhibited was control and measuring instruments intended for carrying out close measurements and automation of measuring processes. A number of the instruments are used for the inspection of parts of ball bearings. They can sort balls at a rate of 15 000 per hour with an accuracy of 1 micron and check the shape of the balls. An instrument is described for the inspection of the dimensions of shafts. It can measure shafts of length 90 to 240 mm with diameters from 10 to 25 mm with a minimum distance of 7 mm between points of measurement. Some optical-mechanical instruments are described. More than half the article is devoted to a description of pneumatic measuring instruments using the contactless method of measurement and inspection. The pneumatic method may be applied to the measurement of internal and external diameters but it cannot always be used on shafts. A defect of the pneumatic method of measurement is that for each kind of measurement it is necessary to have a set of measuring apparatus and regular checking of the calibration. Therefore,

Modern methods of inspecting dimensions in engineering (from materials of an exhibition in East Germany). (Cont.)

this method is most suitable for mass production processes. Pneumatic methods of measurement may find application in the manufacture of standard series of electrical machines.

6 figures, 2 literature references (both German).

Nauchno-issledovatel'skiy Minsterstva
elektrotekhnicheskoy promyshlennosti

AUTHOR: Barsukov, I.A., Engineer. 1 6- 58-7-17/25

TITLE: ~~Determination of~~ the Deformation of Commutator Surfaces under Dynamic Conditions (Izmereniye deformatsiy poverkhnosti kollektorov elektricheskikh mashin v dinamicheskom rezhime)

PERIODICAL: Vestnik Elektropromyshlennosti, 1958, Vol 29, Nr 7, pp 38 - 39 (USSR)

ABSTRACT: At high peripheral speeds, static measurements of commutator shape are inadequate. Because centrifugal forces distort the commutator, measurements must be made whilst the machine is running. A number of methods have been proposed in recent years but the most promising is that of Ryan and Summers which utilises the Doppler effect in microwaves. Short-wave methods were employed in Germany in 1954, using a quarter-wave coaxial waveguide with a wavelength of some decimetres. High sensitivities were achieved but the method is applicable mainly to measurements on rather large objects, preferably non-metallic. Ryan and Summers in America used a wavelength of 1.2 cm to measure the axial shape of rotating surfaces and achieved a resolving capacity of 12 μ. The principal device for transmitting and receiving the reflected energy is a twin-T waveguide bridge, as illustrated

Card1/3

Determination of the Deformation of Commutator Surfaces under Dynamic Conditions

in Figure 1. The operation of the bridge is explained; in effect it converts the varying gap between the open-end of the wave-guide and the rotating surface into an electrical voltage, the amplitude of which is proportional to the mechanical unevenness of the surface. Figure 2 shows a commutator surface diagram and oscillogram taken from the American work. In view of the recent developments in millimetre-wave techniques with frequencies greater than 30×10^9 c.p.s., it is possible to improve the resolving capacity. The Scientific Research Institute of the Electrotechnical Industry made a model for performing measurements with millimetre waves. A block diagram of the equipment is given in Figure 3. Special attention was paid to frequency stability of the reflecting klystron oscillator, which had a wavelength of about 8 mm. A resolving capacity of a few microns requires the voltage stability to be not less than 500 for the anode circuit and 1 000 for the circuits of the modulator and reflector. A cathode ray oscillograph with triggered sweep can be used as an indicator. The sensitivity achieved was of the order of 0.5 mV/μ and

Determination of the Deformation of Commutator Surfaces under Dynamic Conditions

could be improved by more careful manufacture of the waveguide parts. With this equipment, the general eccentricity of a rotating commutator or slipring can be measured and individual high spots can be identified
There are 3 figures and 2 references, 1 of which is Soviet and 1 English.

ASSOCIATION: NII EP

SUBMITTED: November 11, 1957

Card 3/3

SOV/110-59-3-23/25

AUTHOR: ~~Marsukov, I.A.,~~ Engineer

TITLE: Our Country - the Birthplace of Radio (Nasha strana - rodina radio

PERIODICAL: Vestnik Elektropromyshlennosti, 1959, Nr 3, pp 77-80 (USSR)

ABSTRACT: This article commemorates the 100 anniversary of the birth of A.S.Popov on the 16th March 1959. In March 1896, Popov received the first radiogram in the world transmitted by his assistant P.N.Rybkin over a distance of over 250 metres. As Popov published his invention in a Russian journal without patenting it, Marconi, who became familiar with his work, went to England and in June, 1896 put in a patent application in which the subject of the receiver was the same as that used by Popov. Other work done by Popov is reviewed. A general statement is then made about more recent progress in radio communications and other matters allied to Electrical engineering, such as atomic power

Card 1/2

Our Country - The Birthplace of Radio

stations, ice breakers driven by atomic energy, and the Sputniks.

Card 2/2

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9,6000 (1040,1089,1067)

AUTHORS: Lavrinovich, L.L., Candidate of Technical Sciences, Barsukov, I.A., Engineer and Kagan, S.M., Engineer

TITLE: Increasing the Accuracy of Measurement of Certain Parameters of Electrical Machines

PERIODICAL: Vestnik elektropromyshlennosti, 1961, No.2, pp.64-75

TEXT: There are numerous types of instrument for the measurement of the frequency, rotational speed and slip of electrical machines but their range of measurement is very restricted and they are not very accurate. For greater accuracy of measurement it is necessary to develop counter-type instruments which give a direct reading of the values to be measured. With counter-type instruments, the accuracy of measurement of such magnitudes as frequency or speed is much higher. However, until recently, although methods existed, there were in fact no instruments suitable for measurements at sonic frequency and high speeds. With the development of Soviet decatron lamps which can be used to count in the decimal system, it has become possible to make a fairly simple instrument for general use for the measurement of speed, frequency and slip. The use of decatrons

Card 1/5

Increasing the Accuracy ...

sets no limits on the range of values to be measured. The simplicity decatron circuitry and the fact that direct readings are obtained in the decimal system is advantageous in the sonic and infra-sonic frequency ranges. An instrument has been developed for the measurement of sonic frequency, speed and slip of electric motors which can handle frequencies up to 20000 cycles, speeds up to 1200000 rpm in three ranges and slip in a number of ranges up to 0.000001%. In principle, the instrument consists of a photo-electronic signalling device and a decatron counter, with an appropriate supply source. The photo-electronic signalling device converts light signals into voltage impulses which are measured by the counter. The principal components of the counter are the special gas-filled decatron lamps which count impulses in the decimal system. The decatrons are described along with their control circuit. They fulfil the role of a counting and memory device. The decatron counter is the fundamental part of the instrument, it consists of a counting-chain and a time-chain, an electronic switch and quartz oscillators of 10000 and 16666.6 c/s. The counting-chain comprises 6 decatrons which shine immediately opposite numbers on the front panel. The counting-chain is

controlled by a rectangular switching impulse of positive polarity received from the electronic switch. In the absence of a commutating impulse, the counting-chain blocks and input signals received from the former do not affect the counter. The time-chain is identical with the counting-chain and is provided to increase the period of repetition of time signals. The signals applied to the time-chain are: from the quartz generators of 16666.6 c/s, for measuring speed; from the supply circuit of the induction motor, for measuring slip: from the quartz generator of 10000 c/s, for measuring frequency. The electrical part of the photo-electronic signalling device consists of the following components; an incandescent lamp; a photo-electronic convertor based on a photo-electronic multiplier type ЭЭУ-31 (FEU-31); an amplifier based on triode type 6Н2П (6N2P). A ray of light from the lamp passes through an optical system on the rotating object and the reflected beam is picked up by the cathode of the photo-electronic multiplier, which has eight emitters. At the moment of reflection of the light beam, a negative impulse is formed in the anode load of the photo-convertor and is applied to the amplifier triode. Under static conditions in the absence of an impulse

this triode is quiescent The instrument as a whole consists of two units the photo-electronic signalling device and the decatron counter. The power supply is fitted below the decatron counter, the electronic switch, quartz generators and other equipment are in the upper part. The instrument is simple to use The accuracy of the instrument proper depends on the accuracy of adjustment of its parts and in particular on the adjustment of the quartz oscillators. The inherent error of the instrument is analysed and is shown to be the same as the frequency error of the quartz generator. Consequently, the inherent errors of the instrument when measuring frequency and speed are $\pm$ 0,01% When measuring slip the inherent error of the instrument is zero, as the source of time signals is not the quartz generator but the motor supply circuit at the time of measurement. As the counting method can only count whole numbers of impulses, errors can arise through failure to register fractions of a period. This error is analysed for two cases when it is positive and too many impulses are counted and when it is negative and too few are counted. The method of calculating the total error in particular cases is explained and two numerical

examples are worked out; thus in determining the total error when measuring a frequency of 5000 c/s in a period of 100 seconds, the error was 0,51 c/s. In measuring a speed of 7500 rpm in a time of 1 minute, the total error was $\pm$ 1 rpm. It is concluded that the counter-type instrument has an accuracy several times better than that of other instruments for the measurement of sonic frequency, speed and slip of electrical machines. There are 9 figures, 6 tables and 3 references: 1 Soviet and 2 non-Soviet.

SUBMITTED: April 20, 1960

Card 5/5

BARSUKOV, I.A., inzh.

Concerning the possible use of microwave equipment for checking the performance of electric current collectors. Vest.elektroprom. 33 no.2:66-71 F '62. (MIRA 15:2)
(Electric machinery) (Microwaves)

BARSUKOV, I.A., inzh.; ZELICHENKO, E.I., inzh.

Measurement of modulation potential of generators and converters.
Vest. elektroprom. 34 no.5:61-63 My '63. (MIRA 16:5)
(Modulation electronics) (Radio--Equipment and supplies)
(Electric power supply to apparatus)

L 9920-63 EWT(l)/BDS/EEC(b)-2/ES(w)-2--AFFTC/ASD/ESD-3/SSD--Pi-4/Pab-4/Po-4--IJP(C)

ACCESSION NR: AP3000006 S/0057/63/033/005/0537/0543

73
72

AUTHOR: Barsukov, K. A.; Kolomenskiy, A. A.

TITLE: On the longitudinal stability of a charged beam circulating in a medium

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 33, no. 5, 1963, 537-543

TOPIC TAGS: circulating beam stability, negative mass effect, particle beams, plasma

ABSTRACT: The peculiar longitudinal instability of a circulating beam of charged particles associated with the "negative mass effect", discussed for the case of a vacuum by Kolomenskiy, A. A., and Lebedev, A. N. (Proc. of the CERN Symposium of High Energy Accelerators, Geneva, p. 115, 1959) and by Nielson, C. E., Sessler, A. M., and Symon, K. R. (Ibid., p. 239) is considered in the more general case when the particles circulate in a medium characterized by a dielectric constant and magnetic permeability different from unity. The results should have practical importance in connection with particle beams circulating in a plasma. The dispersion equation for the longitudinal oscillations of a beam

Card 1/2

L 9920-63
ACCESSION NR: AP3000006

of charged particles circulating in a toroidal waveguide (of arbitrary cross section) filled with a dielectric medium is obtained in a general form, and conditions for the stability of the oscillations are derived. The effect of the medium is not simple: under some conditions a beam that would be unstable in vacuo is stabilized in the presence of the medium, while under other conditions the medium unstabilizes a beam that would be stable in vacuo. Analytic approximations to the stability conditions are discussed briefly in an appendix, and the case of a toroidal waveguide of circular cross section filled with an electron plasma is considered in some detail. Orig. art. has: 33 equations and 2 figures.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR, Moskva (Physical Institute, AN SSSR, Moscow)

SUBMITTED: 03May62 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NR REF SOV: 002 OTHER: 002

lm/ja
Card 2/2

L 10503-63 EWT(1)/EWG(k)/BDS/ES(w)-2--AFFTC/ASD/ESD-3/SSD--Pz-4/
Pab-4--AT/IJP(C)

ACCESSION NR: AP3000011 S/0057/63/033/005/0561/0564

AUTHOR: Barsukov, K. A.

TITLE: Longitudinal instability of a charged beam circulating in a cylindrical cavity

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 33, no. 5, 1963, 561-564

TOPIC TAGS: longitudinal beam instability, negative mass effect

ABSTRACT: Consideration is given to the stability of a charged-particle beam circulating in a cylindrical cavity consisting of a coaxial line sector closed on two sides by metallic covers or formed into a ring filled with a medium the refractive index and dielectric constant of which are fixed. A previous work of the author on stabilization of beam instabilities through the influence of a medium (beam curvature was neglected) is extended to include the case of a beam with a finite path curvature. This condition is shown to exert considerable influence on the properties of the beam, and increase of path curvature can lead to instability even in vacuum. A dispersion equation is derived describing longitudinal oscillations of the beam which can lead to instabilities both in

Card 1/2

L 10503-63
ACCESSION NR: AP3000011

2

precritical and postcritical regions under various conditions. One of the instability mechanisms that obtains both in a medium and in vacuum is a Cerenkov interaction between the electromagnetic field and the beam. "The author thanks Professor A. A. Kolomenskiy for his discussion." Orig. art. has: 24 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR, Moscow (Physics Institute, AN SSSR)

SUBMITTED: 03May62 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH, SD NO REF SOV: 002 OTHER: 002

ss/WW
Card 2/2

VINOGRADOV, A.P., akademik, otv. red.; BARANOV, V.I., red.; BARSUKOV, V.L., red.; BEUS, A.A., red.; VALYASEKO, M.G., red.; GERASIMOVSKIY, V.I., red.; KORZHINSKIY, D.S., red.; KONOV, A.B., red.; TUGARINOV, A.I., red.; KEITAROV, N.I., red.; SHCHERBINA, V.V., red.; TARASOV, L.S., red. izd-va; DOROKHINA, I.N., tekhn. red.

[Chemistry of the earth's crust]Khimiia zemnoi kory; trudy. Moskva, Izd-vo Akad.nauk. Vol.1. 1963. 430 p. (MIRA 16:3)

1. Geokhimicheskaya konferentsiya, posvyashchennaya stoletiyu so dnya rozhdeniya akademika V.I.Vernadskogo, Moscow, 1963. (Geochemistry)

24(5)
AUTHOR: Barsukov, K. A.

SOV/56-36-5-28/76

TITLE: On the Doppler Effect in an Anisotropic and Gyrotropic Medium (Ob effekte Dopplera v anizotropnoy i girotropnoy srede)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 5, pp 1485-1491 (USSR)

ABSTRACT: Hitherto only the Doppler effect of a source moving in an isotropic medium has been investigated, and it was shown that by dispersion a splitting-up of the Doppler frequency occurs. In connection with investigations of the ionosphere (e.g. by means of the Sputniks) and the electron plasma, which, in the presence of a magnetic field, have properties of an anisotropic and gyrotropic crystal, it is of interest to investigate the field properties of a radiating body moving in such a medium. New effects occur, which consist in a variation of the electromagnetic field components and in an additional splitting-up of the initial frequency, which depends on the degree of anisotropy and the amount of the gyration parameter. These problems are investigated in the present paper. An electrical oscillator of arbitrary orientation moving along the axis of an

Card 1/3

anisotropic and gyrotropic crystal is investigated. The motion (along the z-axis) of the oscillator, which is considered to be punctiform, developed at a constant velocity $\vec{v}$; the frequency is assumed to be ω_c' the electric moment to be $\vec{p}_o' \cos \omega_o' t'$ and the magnetic moment is assumed to be $\vec{m}_o' \cos \omega_o' t'$. For these assumptions the Maxwell equations for the system are written down and solved. In the second part of the paper the special cases are investigated in which a) the oscillator is parallel to z, and b) vertical to z. In the following chapter the complex Doppler effect is investigated by using the results obtained by Frank (Ref 1), and chapter 4 deals with the energy emitted by the radiating body in the two main orientations. Chapter 5 finally, by way of an example, mentions the case of a uniaxial crystal in which an oscillator moves (again in the orientations a) and b)). In the last chapter, the special features characterizing the Doppler effect in a uniaxial gyrotropic crystal are compared with an isotropic medium and discussed. It is shown that in a uniaxial anisotropic crystal without optical activity, when the crystal parameters are

On the Doppler Effect in an Anisotropic and Gyrotropic Medium

SOV/56-36-5-28/76

determined from the oscillator model, there exists a frequency range in which, at arbitrary angles, an "inverse" Doppler effect may occur (cf. also Tafomov, reference 6). The general formulas for the radiation energy derived in this paper make it possible, among other things, also to calculate the Cherenkov radiation of a charge and a dipole. The author thanks A. A. Kolomenskiy for raising the problem and for his interest in this work and he further thanks Professor V. L. Ginzburg and P. V. Bel'tsovskiy for their valuable advice. There are 8 Soviet references.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev of the Academy of Sciences, USSR)

SUBMITTED: November 19, 1958

Card 3/3

BARSUKOV, K.A.

Transition radiation in a wave guide. Zhur.eksp.i teor.fiz. 37 no.4:1106-1109 O '59. (MIRA 13:5)

1. Fizicheskiy institut im. P.N.Lebedeva Akademii nauk SSSR.
(Wave guides)

BARSUKOV, K. A., Cand Phys-Math Sci -- (diss) "Problems of radiation in hypotronic media and in the presence of bounds." Moscow, 1960. 7 pp; (Moscow State Pedagogical Inst im V. I. Lenin); 150 copies; price not given; bibliography at end of text (10 entries); (KL, 26-60, 129)

S/141/60/003/02/021/025
E032/E314

AUTHORS: Barsukov, K.A. and Bolotovskiy, B.M.

TITLE: Energy Losses of a Charged Particle due to Transient Electromagnetic Radiation from a Moving Boundary

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1960, Vol 3, Nr 2, pp 336 - 338 (USSR)

ABSTRACT: The theory of transient radiation was developed by Ginzburg and Frank in Ref 1 and Garibyan and Pafomov (Refs 2). In their work, the transient radiation from a boundary at rest was considered. The present paper generalises the analysis to the case of a moving boundary. The total energy of the radiation can in this case be obtained with the aid of the Lorentz transformation. However, in order to carry this out it is necessary to know not only the energy but also the momentum of the radiation in a system of coordinates in which the boundary is at rest. Moreover, in the case of a moving boundary the total energy of the radiation is not equal to the total particle energy losses since the radiation is associated both with the kinetic energy of the particle and the kinetic energy of the boundary. In the present

Card1/5

Energy Losses of a Charged Particle due to Transient Electromagnetic Radiation from a Moving Boundary

paper it is the kinetic energy of the boundary which is under discussion. The kinetic energy of the particle varies owing to the retarding field and the fact that the character of the field carried along by the particle changes during its transition from one medium into another. The latter effect need not be taken into account if the particle intersects a plate having a finite thickness. The calculations given in the present paper did not take into account changes in the field carried along by the charged particles ("mass renormalization"). However, it is indicated how this effect can be taken into account in certain simple cases. The problem is of interest in astrophysics where charged particles can collide with moving charged clouds and also in plasma physics. The most convenient method which can be employed in the energy loss calculation is to use the Lorentz transformation of the known solution for a boundary at rest. The energy loss associated with the transition across a boundary at rest is defined by Eq (1), which is the integral of the

Card2/5

Energy Losses of a Charged Particle due to Transient Electromagnetic Radiation from a Moving Boundary

retarding field along the path of the particle. In Eq (1), E_z is the component of the electric vector in the direction of the particle velocity w. A formula for E_z is given in Ref 2. In a system of coordinates moving with a velocity u relative to the separation boundary, u being perpendicular to the boundary, the electric field is given by Eq (2), while the particle velocity is given by Eq (3). The field at the particle, i.e. for $z' = vt'$, can easily be obtained from Eq (2) and is given by Eq (4). Integration of this quantity with respect to z' gives the energy loss for a particle moving with a velocity v. These losses are associated with a transition across the boundary which is moving with a velocity u and are given by Eq (5), where I_0 is the same function as in Eq (1) except that its argument is the relative velocity of the charge and the boundary. Eq (5) holds provided the condition given by Eq (6) is satisfied. For small values of v the latter inequality is not satisfied and Eq (5)

Energy Losses of a Charged Particle due to Transient Electromagnetic Radiation from a Moving Boundary

does not hold. In the latter case the change in the energy associated with the passage of the particle across the boundary can be estimated as follows. Eq (7) gives a measure of the change in the particle momentum and provided p is much less than mc the energy change is $p^2/2m$. In the ultra-relativistic case, when the particle moves with a velocity close to the velocity of light and the boundary moves towards the particle also with a velocity close to the velocity of light ($v \simeq c$, $u \simeq -c$), the situation is described by Eqs (8) and (9), from which it follows that the change in the energy of the particle during its passage through the boundary is independent of the velocity of the boundary. If the relative velocity of the charge and the boundary is close to the velocity of light, the change in the energy of the field carried along by the particle is given by Eq (10). Acknowledgment is made to V.L. Ginzburg for discussions of the present results.

Card4/5 This is an abridged translation.

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E032/E314

Energy Losses of a Charged Particle due to Transient Electromagnetic Radiation from a Moving Boundary

There are 2 Soviet references

ASSOCIATION: Fizicheskiy institut im. P.N. Lebedeva AN SSSR
(Physics Institute im. P.N. Lebedev, Ac.Sc. USSR)

SUBMITTED: December 22, 1959

VC

Card 5/5

84562

S/057/60/030/011/005/009
B006/B054

9,1300 (1006, 1144, 1331)

AUTHOR: Barsukov, K. A.

TITLE: Transition Radiation in a Plate Situated in a Waveguide

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960 Vol. 30, No. 11, pp. 1337-1346

TEXT: V. L. Ginzburg and I. M. Frank (Ref. 1) were the first to study transition radiation in an unbounded space, like other authors in later investigations. The author of the present paper had previously studied (Ref. 4) transition radiation at the boundary of two media situated in a waveguide, in connection with the possibility of using transition radiation in counters of superfast particles, and for the generation of millimeter radio waves. In the present paper, he investigates transition radiation in a plate situated in a waveguide. He considers an ideal cylindrical waveguide which is placed in an orthogonal coordinate system parallel to the z-axis, making the following assumptions: the space $0 < z < d$ in it is filled with a plate having the dielectric constant ε, and the remaining space is a vacuum. Proceeding from the negative z-axis, a particle with

Card 1/3

Transition Radiation in a Plate Situated in a Waveguide

S/057/60/030/011/005/009
B006/B054

the velocity v and the charge q hits the plate. Like in Ref. 4, the author first writes down the relations holding for the vector potential A_ω which, along with the basic equations for the vector field (E_ω, H_ω), he uses to derive expressions which fully describe the field in the waveguide. He also gives formulas for the energy emitted (in both directions), $W^{\pm}$. As these formulas are too complicated for a physical analysis, the author studies some special cases which allow an approximative treatment. First, he considers the case of a thin plate $(\lambda'_n/d \gg 1)$ for which he further assumes that $\omega d/v \ll 1$ and $\lambda^0/d \gg 1$, respectively; λ'_n is the wavelength in the plate, and λ^0 that in the vacuum. As another simplification, he considers the ultrarelativistic case $(\beta=1)$ for which he obtains the simple relation $W^{+} = \frac{q^2 d^2}{2\pi c^3} \ln \frac{1}{\sqrt{1-\beta^2}} \int |\varepsilon - 1|^2 \omega^2 d\omega$. Next, he investigates transition radiation in a thick $(\lambda'_n/d \ll 1)$ plate; thereby, he understands the case in which the total transition radiation energy does not depend

Card 2/3

84562

Transition Radiation in a Plate Situated in a Waveguide

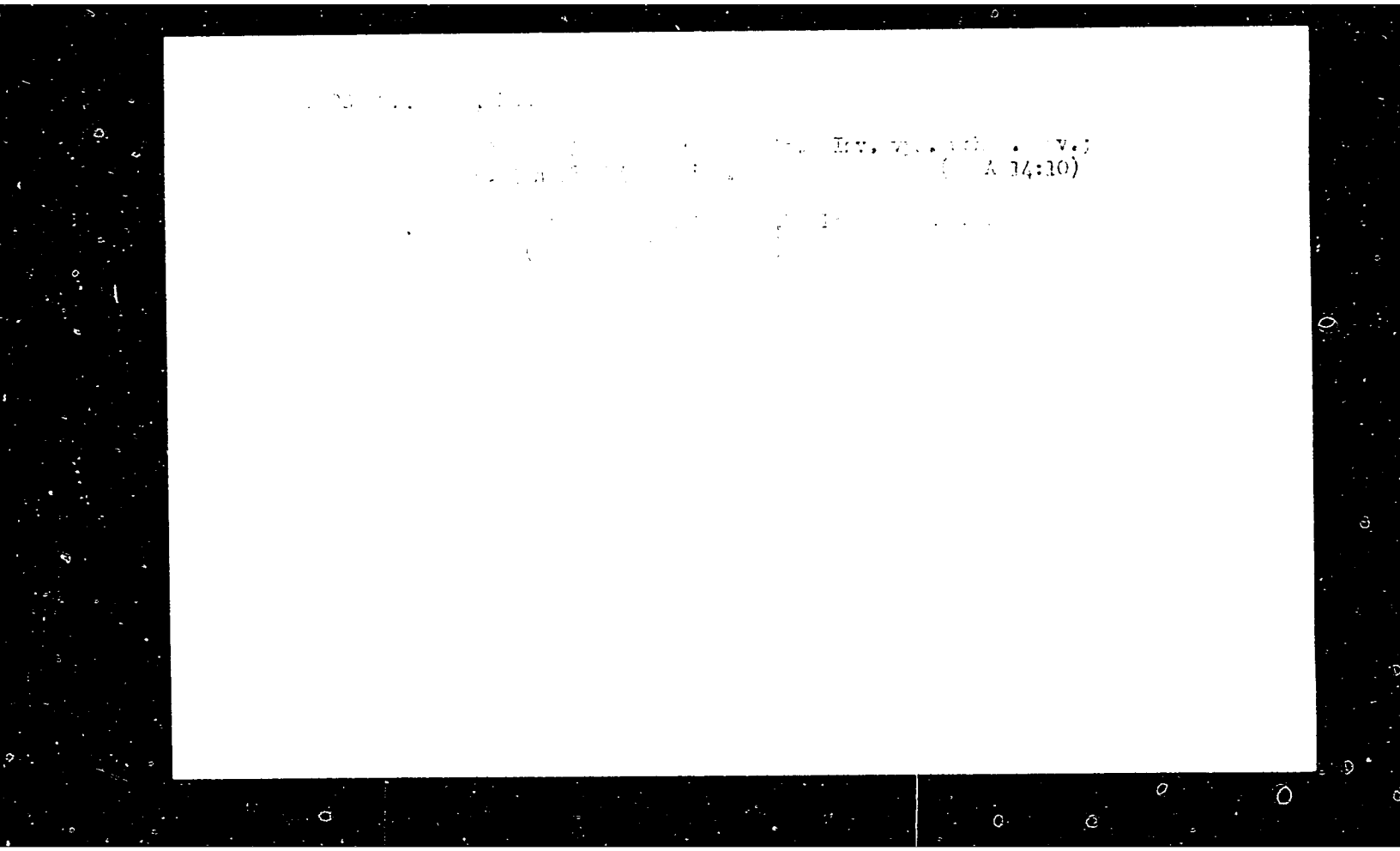
S/057/60/030/011/005/009
B006/B054

on the plate thickness d. He formulates the corresponding criteria, and derives an explicit formula for $W^{\pm}$. Following this he considers the case of a thick plate when $\beta^2\varepsilon > 1$ and Cherenkov radiation may occur in the medium. Using the results of the preceding section, the author also gives formulas for $W^{\pm}$ and $W_{Cherenkov}$. Finally, he studies the case of "blocked radiation", i. e., the transition radiation is supposed to be barred within the plate. In this case, the plate proves to be a kind of resonator excited by the particle passing through. The author thanks B. M. Bolotovskiy for discussions. There are 2 figures and 9 references: 8 Soviet and 1 Czechoslovakian.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR Moskva (Institute of Physics imeni P. N. Lebedev AS USSR, Moscow)

SUBMITTED: January 15, 1960

Card 3/3



S/057/62/032/002/005/022
B104/B102

AUTHOR: Barsukov, K. A.

TITLE: Some characteristic features of the Doppler effect in anisotropic media

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 2, 1962, 161-167

TEXT: The author uses results obtained by I. M. Frank (Izv. AN SSSR, ser. fizich., 6, 3, 1942) to obtain the conditions at which complex Doppler effects of the first and second kind occur. It is demonstrated that these effects occur more probably in anisotropic media than in isotropic ones. $\left|\frac{1}{n}\,\partial n_i/\partial_a\right| \gg 1$ is found to be a necessary and sufficient condition for the occurrence of these effects. $n_i(\omega,\vec{k}_i)$ is the refractive index of the medium for waves of different polarization (i = 1,2). The complex Doppler effect is studied in a plasma where the group velocity of the waves is [illegible]. If the waves propagate along a magnetic field the following [illegible]ation is obtained:

Card 1/4

Some characteristic features ...

$$\omega_H - \omega_k \simeq \left(\frac{\omega_H \omega_A^2 \beta_\vartheta^2}{4}\right)^{1/3} \qquad (20).$$

ω_H is the gyromagnetic plasma frequency. The electron-ion collision frequency is

$$\nu_{эфф.} = \frac{5.5N}{T_e^{3/2}} \ln\left(220 \frac{T_e}{N^{1/2}}\right) \qquad (22).$$

N is the electron concentration, T_e is the electron temperature. The upper limit of $\beta = \vec{v}\cos\vartheta/c$ at which the complex Doppler effect still occurs is

$$\beta_\vartheta^{2/3} \gg \frac{1.73}{T_e^{3/2}} \left(\frac{\omega_N}{\omega_H}\right)^{1/3} \cdot 10^{-9} \ln\left(220 \frac{T_e}{N^{1/3}}\right) \qquad (23).$$

$\vec{v}$ is the velocity of the source, ϑ is the angle between velocity and wave vector. For the F_2 layer of the ionosphere at $T = 2000^\circ K$, $N = 6 \cdot 10^5$ cm^{-3}, $\omega_H = 8.82 \cdot 10^6$ sec^{-1} the author obtains: $\beta_\vartheta \gg 0.7 \cdot 10^{-6}$ and

Card 2/4

Some characteristic features ...

$\bar{v} \geqslant 2100$ m/sec. With large dn_i/dk the complex Doppler effect can be observed also at large angles of observation. In anisotropic media it is possible that the projections of the wave vector and the group velocity onto the direction of motion have opposite signs. Hence it is concluded that lower frequencies are emitted in forward direction and higher frequencies in backward direction. In the x, ϑ plane ($x = \omega/\omega_N$, ω_N is the plasma frequency) the range in which this effect occur is bounded by the two curves

$$(x^2-1)(x^2-m^2)-m^2\sin^2\vartheta=0, \qquad (27)$$

and

$$\sin^2\vartheta=\frac{2(x^2-1)(1-x^{-1}(x^2-m^2)^{1/2})}{m^2(1+x^{-1}(x^2-m^2)^{-1/2})} \qquad (29)$$

(Fig. 3). $x_0 = \sqrt{\frac{m^2+\sqrt{m^4+4}}{2}}$, $m = \omega_H/\omega_H$. Charged particles moving along a magnetic field may therefore have a Cherenkov cone directed backward. There are 3 figures and 8 Soviet references.

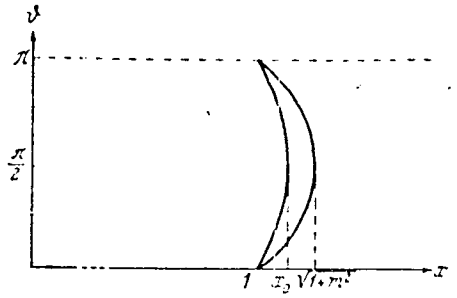
Card 3/4

Some characteristic features ...

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Moskva (Physics Institute imeni P. N. Lebedev, Moscow)

SUBMITTED: March 27, 1961

Fig. 3



Card 4/4

L 15618-63 EWT(1)/BDS/EED-2/EEO-2 AFFTC/ASD/AFMDC/ESD-3/RADC/APGC
Pj-4/Pk-4/Pl-4/Pm-4 WR
ACCESSION NR: AP3004830 S/0141/63/006/003/0449/0456

AUTHOR: Barsukov, K. A.; Suchkin, G. L.

TITLE: Radiation-line width in a complex Doppler effect

SOURCE: IVUZ. Radiofizika, v. 6, no. 3, 1963, 449-456

TOPIC TAGS: Doppler effect, radiation line, radiation-line width

ABSTRACT: When a source of electromagnetic waves travels in a dispersing medium, the radiation spectral line can split along a fixed direction. Conditions of resolvability of broadened spectral lines are theoretically investigated, as well as the effect of finite duration of the radiation source and the effect of absorption. It is shown that the above conditions can be reduced to the well-known conditions of complex spectral composition of half-intensity radiation. Resolvability conditions for a loss-free medium are considered in detail, as well as the peculiarities of spectrum in a low-loss case. It is found that, under certain conditions, the

Card 1/2

L 15618-63
ACCESSION NR: AP3004830

observable line width is practically independent of the duration of radiation and is entirely determined by the characteristics of the dispersing medium. The results were obtained for the purpose of evaluating the observation of complex Doppler radiation at thermal velocities for very narrow spectral lines. "In conclusion, we are using this opportunity to thank I. M. Frank for his constant attention to the subjects in question." Orig. art. has: 1 figure and 25 formulas.

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific-Research Radiophysics Institute, Gor'kiy University)

SUBMITTED: 010ct62 DATE ACQ: 27Aug63 ENCL: 00

SUB CODE: PH NO REF SOV: 004 OTHER: 000

Card 2/2

BARSUKOV, K.A.

Excitation of gyrotropic waveguides. Radiotekh. i elektron. 8 no.6:1071-1072 Je '63. (MIRA 16:7)

1. Fizicheskiy institut im. P.N.Lebedeva AN SSSR.
(Wave guides)

S/057/63/033/004/013/021
B163/B234

AUTHORS: Naryshkina, L. G., and Barsukov, K. A.

TITLE: On the radiation of an oscillator moving in a waveguide

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 33, no. 4, 1963, 444 - 454

TEXT: The radiation of an electromagnetic oscillator moving along the axis of a cylindrical ideal waveguide filled with a dielectric of dielectric constant ϵ, is studied theoretically. The presence of boundaries affects the radiation field of the oscillator. Formulas for the spectrum and the radiation energy are derived. The radiation spectrum becomes discrete, and a complex Doppler effect arises even in a waveguide without filling. The Doppler effect is called complex if one frequency of the source corresponds to more than one Doppler frequencies. This happens when the velocity of the source exceeds the group velocity of the wave packet whose center corresponds to a definite Doppler frequency. If $\beta^2\epsilon > 1$ (β is the ratio of the source velocity and the velocity of light), a super-light Doppler effect can even occur which is always complex, and for which the number of Doppler frequencies is necessarily even. If the path of the oscillator is

Card 1/2

limited, or if the walls of the waveguide have a finite conductivity, the width of the Doppler lines become finite. The line widths are calculated for both cases. The reactive force of the radiation on the oscillator is studied, and it is found that in the super-light case, i.e. when the velocity of the oscillator exceeds the phase velocity of light in the dielectric, the radiation force affecting the oscillation amplitude can be greatly reduced. If the dispersion $\varepsilon(\omega)$ is taken into account, it is found that even amplification of the oscillation amplitude is possible in an isotropic dielectric. There are 2 figures.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Engineering-physics Institute)

SUBMITTED: March 24, 1962 (initially)
June 26, 1962 (after revision)

BARSUKOV, K.A.; KOLOMENSKIY, A.A.

Longitudinal stability of a charged beam circulating in a medium.
Zhur.tekh.fiz. 33 no.5:537-543 My '63. (MIRA 16:6)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR, Moskva.
(Particles (Nuclear physics))

BARSUKOV, K.A.

Longitudinal instability of a charged beam circulating in a cylindrical resonator. Zhur.tekh.fiz. 33 no.5:561-564 My '63. (MIRA 16:6)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR, Moskva.
(Particles (Nuclear physics))

L 16881-63 EWT(1)/EWT(m)/BDS AFFTC/ASD

ACCESSION NR: AP3005283 S/0056/63/045/002/0303/0304

AUTHOR: Barsukov, K. A.; Bolotovskiy, B. M. 54 53

TITLE: Radiation emitted by fast particles in an unstationary inhomogeneous medium

SOURCE: Zhur. eksper. i teoret. fiz., v. 45, no. 2, 1963, 303-304

TOPIC TAGS: fast particle radiation, nonstationary medium, inhomogeneous medium, Cerenkov radiation

ABSTRACT: The singularities of the radiation of a charged particle in a nonstationary medium are considered in view of recent interest in the use of such media for frequency multiplication, for parametric amplification, and similar applications. The phenomena induced by the passage of the charge are interpreted from the point of view of energy and momentum conservation. An expression is derived for the radiation intensity, which under suitable conditions yields

Card 1/2

L 16881-63

ACCESSION NR: AP3005283

also the energy lost by a charge to Cerenkov radiation. Orig. art has: 8 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (P. N. Lebedev Physics Institute, Academy of Sciences SSSR)

SUBMITTED: 02Feb63 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: PH NO REF SOV: 008 OTHER: 000

Card 2/2

BARSUKOV, K.A.

Radiation from a charge moving in an inhomogeneous magnetoactive medium. Zhur.tekh. fiz. 34 no.4:725-730 Ap '64. (MIRA 17:4)

1. Fizicheskiy institut imeni Lebedeva AN SSSR, Moskva.

BARSUKOV, K.A.; BOLOTOVSKIY, B.M.

Emission of fast particles in a nonstationary inhomogeneous medium. Zhur. eksp. i teor. fiz. 45 no.2:303-304 Ag '63. (MIRA 16:9)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR.
(Radiation)

ACCESSION NR: AP4028962 S/0057/64/034/004/0725/0730

AUTHOR: Barsukov, K.A.

TITLE: On the radiation of a charge moving in a nonuniform magnetically active medium

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.4, 1964, 725-730

TOPIC TAGS: radiation, nonuniform medium radiation, gyromagnetic medium radiation, gyrotropic medium radiation, particle motion

ABSTRACT: The radiation of a point charge moving uniformly in a nonuniform magnetically active medium is calculated in the geometric optics (short wavelength) approximation. The calculation was undertaken because of possible applications to fast particle detection, to the motion of charged particles in plasmas in the laboratory and in cosmic space, and to devices employing ferrites in nonuniform fields. The medium is described by Hermitian dielectric and permeability tensors, the components of which are assumed to depend only on the coordinate z of a rectangular system xyz. The radiation field is expanded in a triple Fourier integral in x, y, and t (time) and appropriate general solutions of Maxwell's equations are obtained in the geome-

Card 1/2

ACCESSION NR: AP4028962

tric optics approximation (expansion in powers of the wavelength). Maxwell's equations are solved separately for the two cases of a gyromagnetic and a gyrotropic medium. The time Fourier component of the charge density is written for a point particle moving uniformly along the z axis. With the aid of this, the general solutions of Maxwell's equations are specialized to represent the radiation field of the particle. As an example, the general formulas are specialized to the case of a particle moving in a uniform plasma in the presence of a weak spatially periodic longitudinal magnetic field. The radiation is confined to bands about the harmonics of the frequency at which the static magnetic field appears to oscillate when viewed from the moving particle. The formula for the power radiated is similar to that derived by M.L.Mikaelyan (Izv.AN Arm.SSR,Ser.fiz.14,103,1961) for the radiation from a particle moving in a plasma with a spatially periodic density. The differences between the two formulas are discussed briefly. Orig.art.has: 27 formulas.

ASSOCIATION: Fizicheskiy institut im.P.N.Lebedeva,AN SSSR,Moscow (Physical Institute AN SSSR)

SUBMITTED: 19Apr63 DATE ACQ: 28Apr64 ENCL: 00

SUB CODE: PH NR REF SOV: 004 OTHER: 000

Card 2/2

L 38109-65 EWT(l)/EPF(c)/EIG(t) Pi-4 IJP(c) WW/GG

ACCESSION NR: AP5006031 S/0141/64/007/006/1187/1189

AUTHOR: Barankov, K. A.; Ginzburg, V. L.

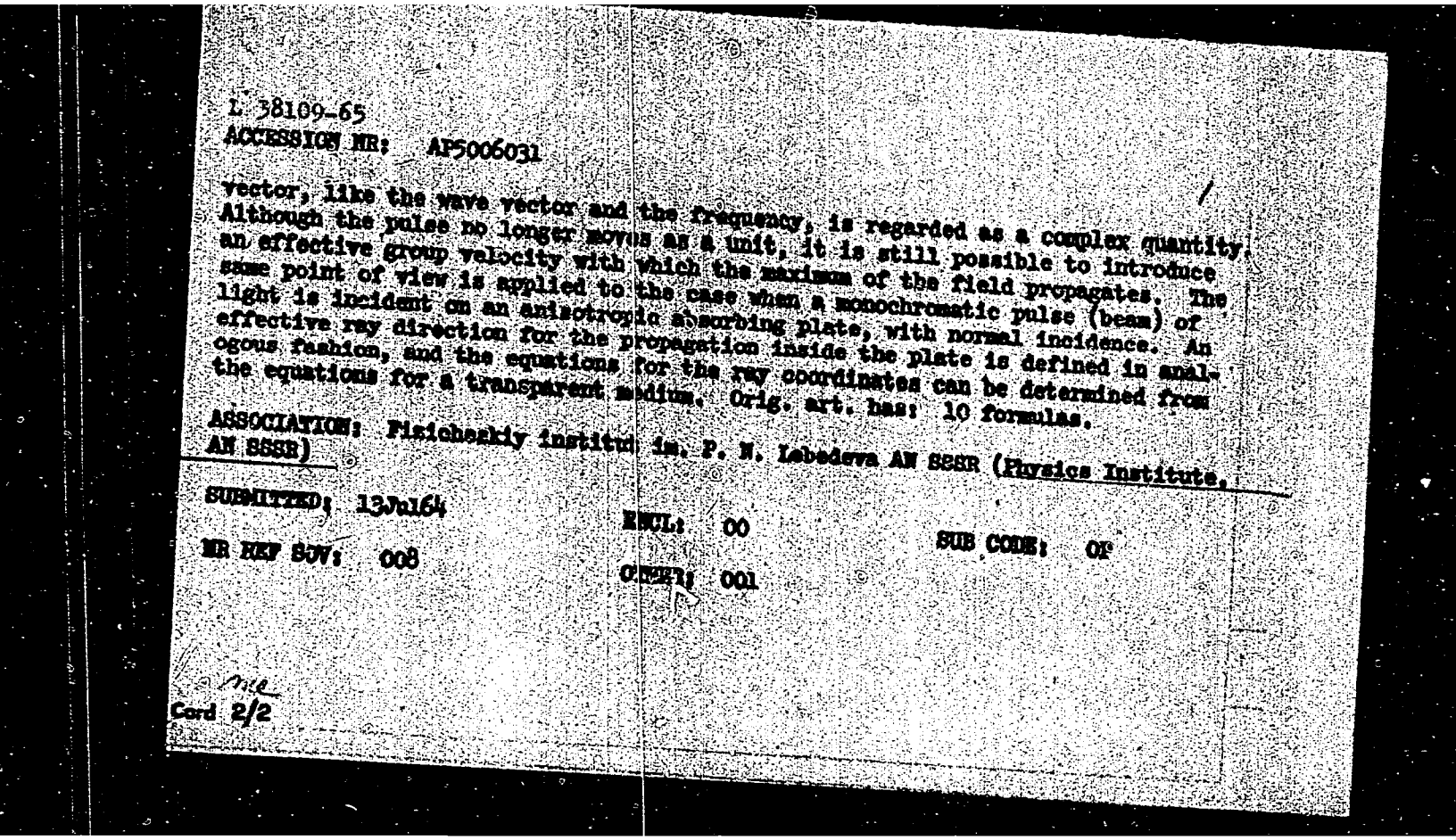
TITLE: On the ray direction and group velocity in an absorbing anisotropic medium

SOURCE: IVUZ. Radiofizika, v. 7, no. 6, 1964, 1187-1189

TOPIC TAGS: light ray, ray propagation, group velocity, absorbing medium, anisotropic medium, optical medium

ABSTRACT: Asserting that light propagation in an absorbing anisotropic medium has not been treated in the literature before, the authors consider a packet of waves (a pulse) propagating in an arbitrary linear medium without external field sources. The pulse is assumed quasimonochromatic and the medium is assumed anisotropic and absorbing. Since the pulse becomes distorted in such a medium and the concept of the velocity of the pulse as a whole has no meaning, it is assumed that the ray direction in such a case is that of the energy flux S. It is shown that the formulas for the field of a quasimonochromatic pulse in an absorbing isotropic medium are valid also for an anisotropic medium, provided the position

Card 1/2



L 38109-65
ACCESSION NR: AP5006031

vector, like the wave vector and the frequency, is regarded as a complex quantity. Although the pulse no longer moves as a unit, it is still possible to introduce an effective group velocity with which the maximum of the field propagates. The same point of view is applied to the case when a monochromatic pulse (beam) of light is incident on an anisotropic absorbing plate, with normal incidence. An effective ray direction for the propagation inside the plate is defined in analogous fashion, and the equations for the ray coordinates can be determined from the equations for a transparent medium. Orig. art. has: 10 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR)

SUBMITTED: 13Ja164 ENCL: 00 SUB CODE: OP

NR REF SOV: 008 OTHER: 001

Card 2/2

BARSUKOV, K.A.; BOGOVSKIY, B.A.

Radiation from a charged particle moving in a nonstationary inhomogeneous medium. Izv. vys. ucheb. zav. radiofiz. 7 no.2: 291-299 '64. (MIRA 18:1)

1. Fizicheskiy institut imeni P.N. Lebedeva AN SSSR.

L 47305-65 EWT(l)/EWP(m) Pd-l GS

ACCESSION NR: AT5007928 S/0000/64/000/000/0396/0399

AUTHOR: Barsukov, K. A.; Kolomenskiy, A. A.

TITLE: Longitudinal stability of a charged beam circulating in a medium or retarding system

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy. Moscow, Atomizdat, 1964, 396-399

TOPIC TAGS: high energy accelerator, charged particle beams, plasma physics

ABSTRACT: A circulating beam of charged particles may exhibit free longitudinal instability connected with Coulomb interaction and characteristic of particle motion in a magnetic field whose frequency of reversal depends upon energy $\Omega(E)$. (A. A. Kolomenskiy and A. N. Lebedev, Proceedings of the International Conference on High Energy Accelerators, CERN, 1959). Thus, if the energy dispersion $\Delta E/E$ in a beam is sufficiently small, then for condition $d\Omega/dE < 0$ (post-critical region) the beam will turn out to be unstable; when $d\Omega/dE > 0$ (pre-critical region) it is always stable. For $d\Omega/dE = 0$ (critical point E_{cr}), the beam in the first approxima-

Card 1/3

tion is in neutral equilibrium. These phenomena, sometimes called negative mass effects, have been studied on the assumption that the beams move in a vacuum. At the same time, there is interest in solving a similar problem in the case of the motion of a circulating beam in a system in which slow waves can be propagated. For example, the beam can move in a plasma, as in the case of a plasma (gaseous) between or, in general, in a cyclic accelerator during the injection period. The beam can circulate in a wave-guide with diaphragms, and also in a dielectric medium, or in a channel drilled in it, or in any other retarding system. The criterion of longitudinal instability of a beam in a retarding system can vary substantially. In particular, new regions of instability can appear, or on the contrary the beam in a retarding system can be stabilized relative to certain forms of disturbances under definite conditions. The present report discusses the dispersion equation for a wave-guide with dielectric filler in the case of a toroidal ring with ideally conducting walls in which a beam of charged particles circulate. Also discussed is the stability of this circulating beam. It is concluded that the presence of a plasma can lead to essential variation in the criterion governing the stability of a circulating beam and must certainly be taken into consideration in an investigation of the operation of accelerator, storage, and other devices. The analysis given in the report for the case of a diaphragm wave-guide also revealed a number of

L 47305-65
ACCESSION NR: AT5007928

possibilities for the variation of the criterion of beam stability. For example, the occurrence of instability of the beam as a function of several parameters (e.g. the degrees of wave retardation in the diaphragm wave-guide and of relative energy dispersion in the beam) can be graphically represented. Orig. art. has: 2 figures, 21 equations.

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR)

SUBMITTED: 26May64 ENCL.: 00 SUB CODE: EE, NP

NO REF SOV: 002 OTHER: 002

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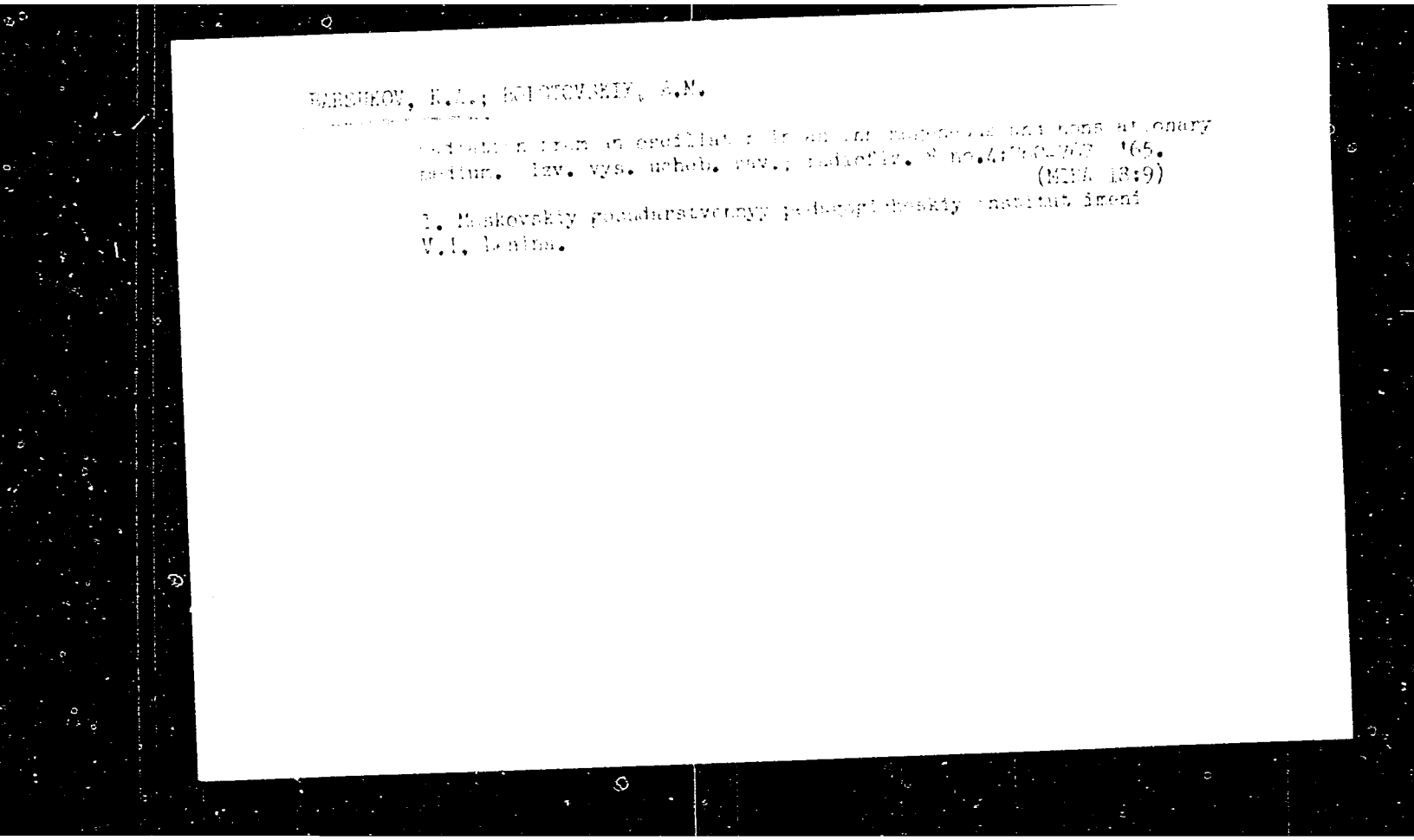
Card 3/3



MIRSHKOV, K.I.; KOTOVSKIY, A.M.

[illegible] (MIRA 18:9)

1. Moskovskiy gosudarstvennyy pedagogicheskiy institut imeni V.I. Lenina.

L 6527-66 EWT(1)

ACC NR: AP5026708 SOURCE CODE: UR/0141/65/008/005/0936/0941

AUTHOR: Barsukov, K. A.; Naryshkina, L. G.

ORG: Moscow State Pedagogical Institute im. V. I. Lenina (Moskovskiy gosudarstvennyy pedagogicheskiy institut)

TITLE: Transient radiation at an anisotropically conducting plane

SOURCE: IVUZ. Radiofizika, v. 8, no. 5, 1965, 936-941

TOPIC TAGS: charged particle, electromagnetic wave generation, electromagnetic energy

ABSTRACT: The article treats the radiation arising from the flight of a charged particle through a dense, ideally conducting lattice which, for a lattice constant $l \ll \lambda$ (where λ is the length of the radiated wave), can be regarded as a plane conducting in one direction. The radiation field and the radiation energy and its angular distribution were determined, and the characteristics of the excitation of slow surface waves by the flying charge are analyzed. The formula derived for the

UDC: 621.371

Card 1/2

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L 3601-66 EWT(m) DIAAP

ACCESSION NR: AP5024038

UR/0057/65/035/009/1606/1609
538.561

AUTHOR: Barsukov, K. A.; Kadantsev, V. N.

TITLE: Concerning peculiarities of the radiation of point dipoles moving in narrow cavities in magnetoactive media

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 9, 1965, 1606-1609

TOPIC TAGS: Cerenkov radiation, magnetic dipole, electric dipole, magnetoactive plasma, ferrite, inhomogeneous medium

ABSTRACT: The authors calculate the Cerenkov radiation of an electric or magnetic dipole moving in a narrow linear or plane cavity in an active medium characterized either by a Hermitian dielectric tensor similar to that of a magnetized plasma or by a Hermitian magnetic permeability tensor similar to that of a magnetized ferrite. It is shown that if the axis of the dipole is parallel to that of the linear cavity or to the walls of the plane cavity, the presence of the narrow cavity has no effect. If the axis of the dipole is perpendicular to its direction of motion, however, the presence of the infinitely narrow cavity has a finite effect. This effect is calculated for both linear and plane cavities for the case in which the cavity is cut in a normal (scalar) medium and filled with an active medium and for

Card 1/2

L 3601-66

ACCESSION NR: AP5024038

the case in which the cavity is cut in an active medium and is filled with a normal medium. If one assumes that the active medium is a magnetized plasma, one finds that the expression obtained for the power radiated from the plane cavity is singular at the two frequencies that limit the pass band of a plasma waveguide. This singularity is only apparent and is due to neglection of higher powers of af/c, where a is the thickness of the cavity, f is the frequency, and c is the velocity of light. Orig. art. has: 13 formulas.

ASSOCIATION: Fizicheskiy institut im. P.N.Lebedeva AN SSSR, Moscow (Physics Institute, AN SSSR)

SUBMITTED: 21May64 ENCL: 00 SUB CODE: EM, ME

NO REF SOV: 004 OTHER: 000

Card 2/2

BARSUKOV, K.A.

Instability of the transverse oscillations of an oscillator moving in a nonideal waveguide. Radiotekh. i elektron. 10 no.10:1792-1796 O '65. (MIRA 18:10)

1. Fizicheskiy institut im. P.N.Lebedeva AN SSSR.

L 23104-66 EWT(1)/T IJP(c)

ACC NR: AP6007068 UR/0057/66/036/002/0225/0229

AUTHOR: Barsukov,K.A.; Naryshkina,L.G.

ORG: Moscow State Pedagogical Institute im. V.I.Lenin (Moskovskiy gosudarstvennyy pedagogicheskiy institut)

TITLE: Radiation of a charge moving above an anisotropically conducting plane

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 2, 1966, 225-229

TOPIC TAGS: charged particle, electromagnetic radiation, electric conductor, anisotropic medium, Cerenkov radiation,

ABSTRACT: The authors calculate the radiation of a charged particle moving at constant velocity parallel to an infinite plane that is perfectly conducting in one of a pair of mutually perpendicular directions and nonconducting in the other. The anisotropically conducting plane may be regarded as a grid of parallel conductors whose spacing is small compared both with the distance of the moving charge from the plane and with the wavelength of the radiated waves. It is found that the moving charge radiates surface waves that propagate along the anisotropically conducting plane. Certain analogies between the present problem and the Cerenkov radiation of a charged particle moving in an isotropic medium are pointed out. The force on the charged particle due to the radiation field is calculated. This force has no component

Card 1/2